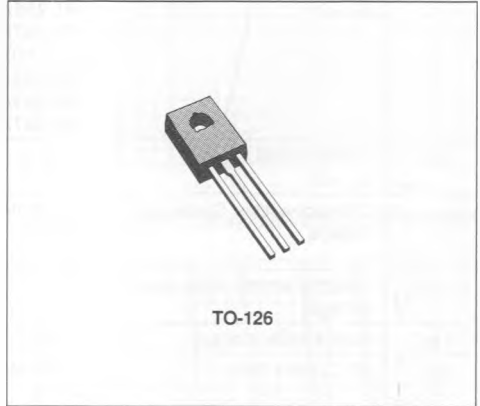


MEDIUM POWER LINEAR AND SWITCHING APPLICATIONS

DESCRIPTION

The BD233, BD235 and BD237 are silicon epitaxial-base NPN power transistors in Jedec TO-126 plastic package intended for use in medium power linear and switching applications.

The complementary PNP types are the BD234, BD236 and BD238 respectively.



INTERNAL SCHEMATIC DIAGRAMS



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	NPN PNP*	Value			Unit
			BD233 BD234	BD235 BD236	BD237 BD238	
V_{CBO}	Collector-base Voltage ($I_E = 0$)		45	60	100	V
V_{CEO}	Collector-emitter Voltage ($I_B = 0$)		45	60	80	V
V_{CER}	Collector-emitter Voltage ($R_{BE} = 1 \text{ K}\Omega$)		45	60	100	V
V_{EBO}	Emitter-base Voltage ($I_C = 0$)		5			V
I_C	Collector Current		2			A
I_{CM}	Collector Peak Current		6			A
P_{Tot}	Total Power Dissipation at $T_{case} \leq 25 \text{ }^\circ\text{C}$		25			W
T_{stg}	Storage Temperature		- 65 to 150			$^\circ\text{C}$
T_J	Junction Temperature		150			$^\circ\text{C}$

* For PNP types voltage and current values are negative.

THERMAL DATA

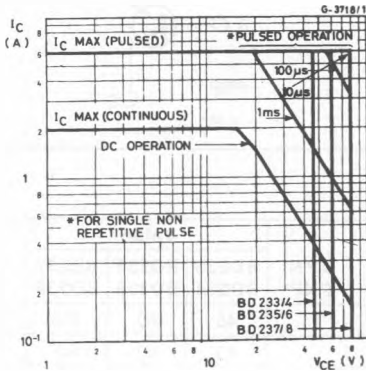
$R_{th(j-c)}$	Thermal Resistance Junction-case	Max	5	°C/W
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ELECTRICAL CHARACTERISTICS ($T_{case} = 25\text{ °C}$ unless otherwise specified)

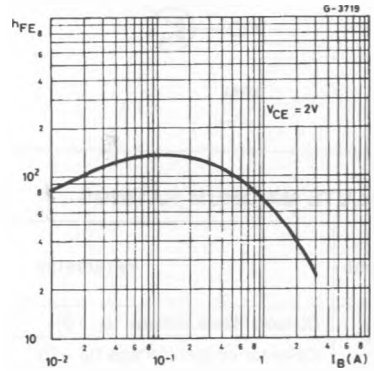
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cutoff Current ($I_E = 0$)	for BD233/34 $V_{CB} = 45\text{ V}$ for BD235/36 $V_{CB} = 60\text{ V}$ for BD237/38 $V_{CB} = 100\text{ V}$ $T_{case} = 150\text{ °C}$ for BD233/34 $V_{CB} = 45\text{ V}$ for BD235/36 $V_{CB} = 60\text{ V}$ for BD237/38 $V_{CB} = 100\text{ V}$			100 100 100	μA μA μA
I_{EBO}	Emitter Cutoff Current ($I_C = 0$)	$V_{EB} = 5\text{ V}$			1	mA
$V_{CE(sus)}^*$	Collector-emitter Sustaining Voltage	$I_C = 100\text{ mA}$ for BD233/34 for BD235/36 for BD237/38	45 60 80			V V V
$V_{CE(sat)}^*$	Collector-emitter Saturation Voltage	$I_C = 1\text{ A}$ $I_B = 0.1\text{ A}$			0.6	V
V_{BE}^*	Base-emitter Voltage	$I_C = 1\text{ A}$ $V_{CE} = 2\text{ V}$			1.3	V
h_{FE}^*	DC Current Gain	$I_C = 150\text{ mA}$ $V_{CE} = 2\text{ V}$ $I_C = 1\text{ A}$ $V_{CE} = 2\text{ V}$	40 25			
f_T	Transition Frequency	$I_C = 250\text{ mA}$ $V_{CE} = 10\text{ V}$	3			MHz
h_{FE1}/h_{FE2}^*	Matched Pairs	$I_C = 150\text{ mA}$ $V_{CE} = 2\text{ V}$		1.6		

* Pulsed : pulse duration = 300 μs , duty cycle $\leq 1.5\%$.
For PNP types voltage and current values are negative.

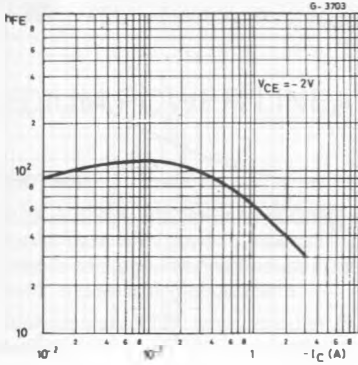
Safe Operating Areas.



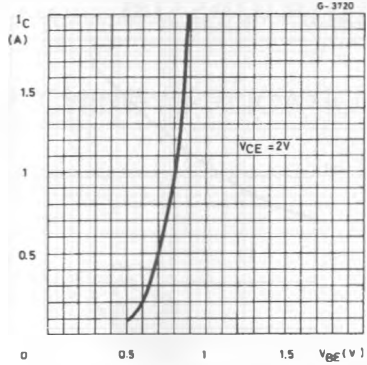
DC Current Gain (NPN types).



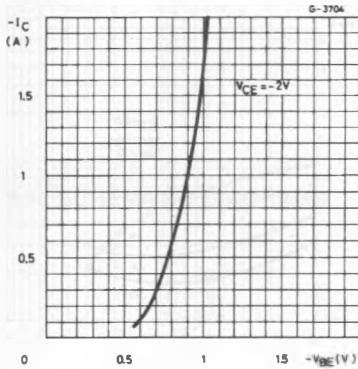
DC Current Gain (PNP types).



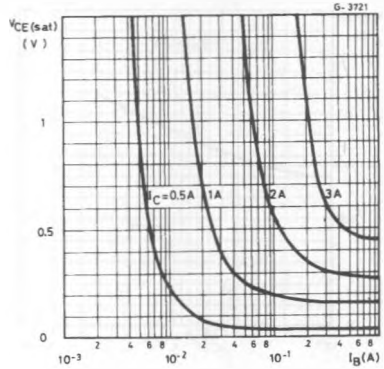
DC Transconductance (NPN types).



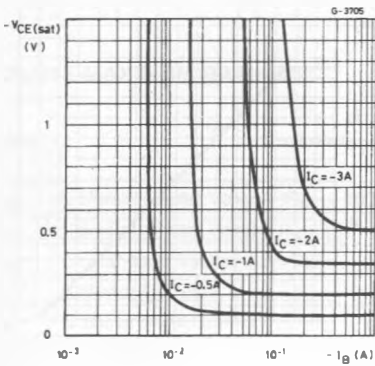
DC Transconductance (PNP types).



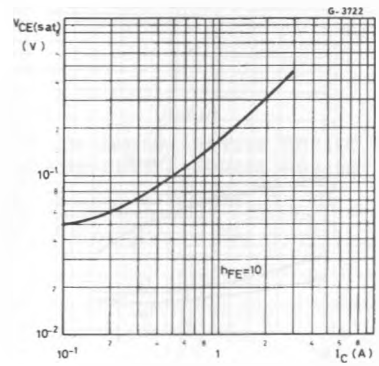
Collector-emitter Saturation Voltage (NPN types).



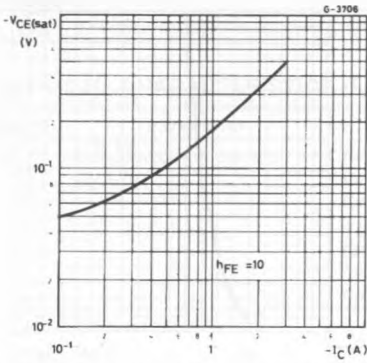
Collector-emitter Saturation Voltage (PNP types).



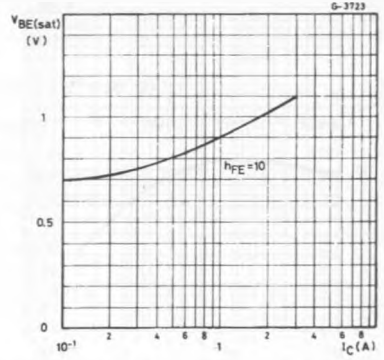
Collector-emitter Saturation Voltage (NPN types).



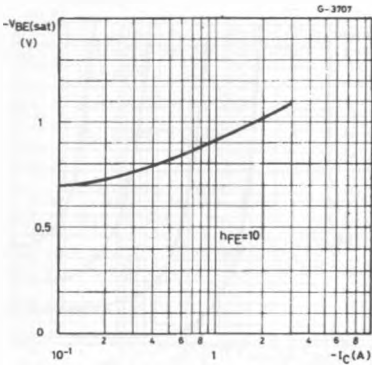
Collector-emitter Saturation Voltage (PNP types).



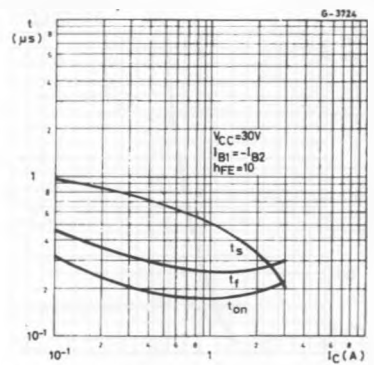
Base-emitter Saturation Voltage (NPN types).



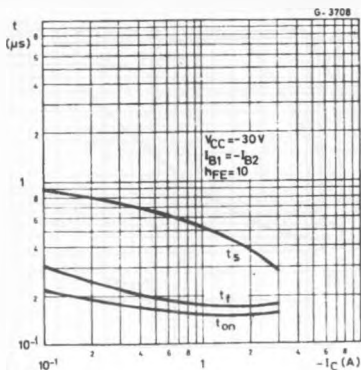
Base-emitter Saturation Voltage (NPN types).



Saturated Switching Characteristics (NPN types)



Saturated Switching Characteristics (PNP types).



Power Derating Chart.

